

**ATTACHMENT A**  
**(Drawing Figures 1-17)**

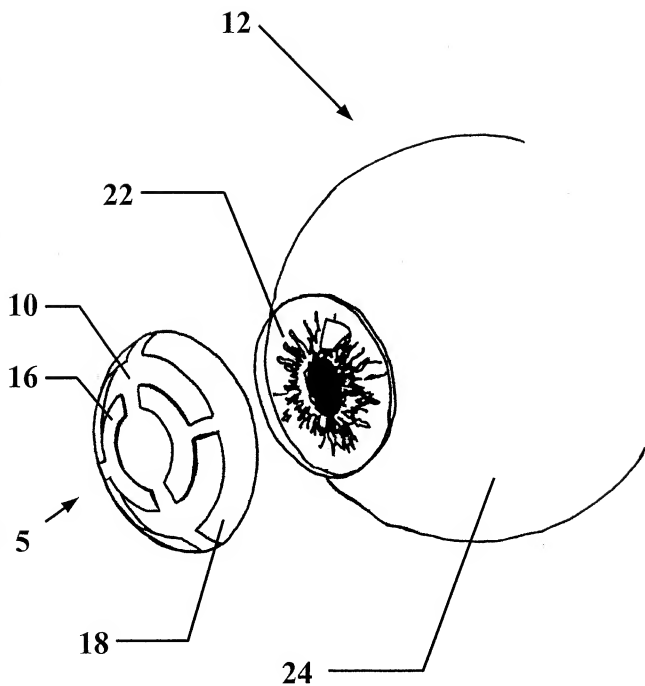


FIGURE 1

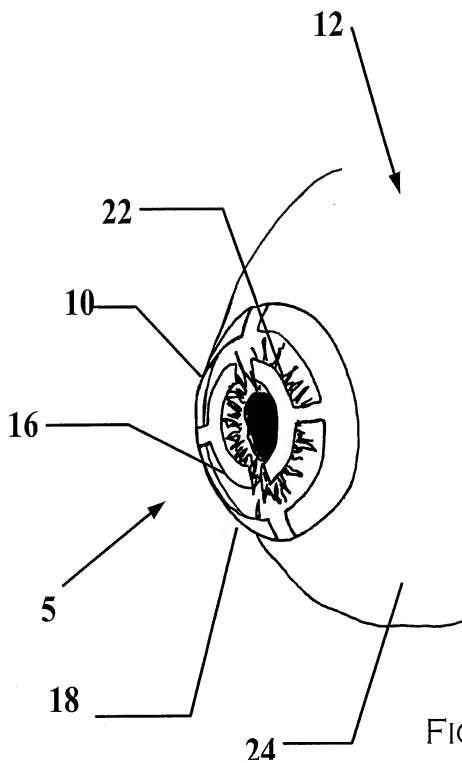


FIGURE 2

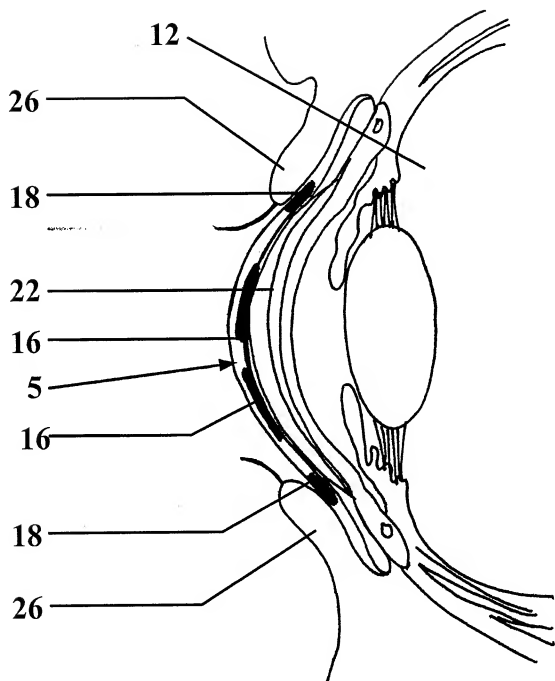


FIGURE 3

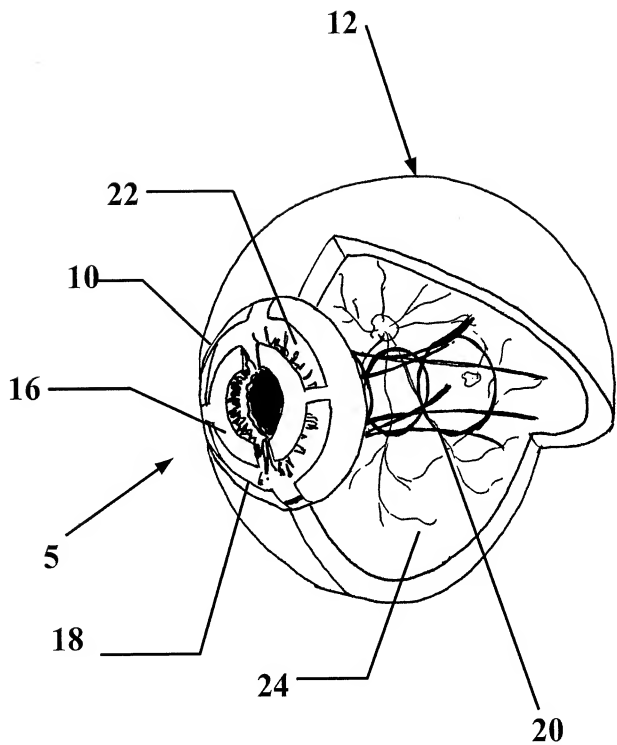


FIGURE 4

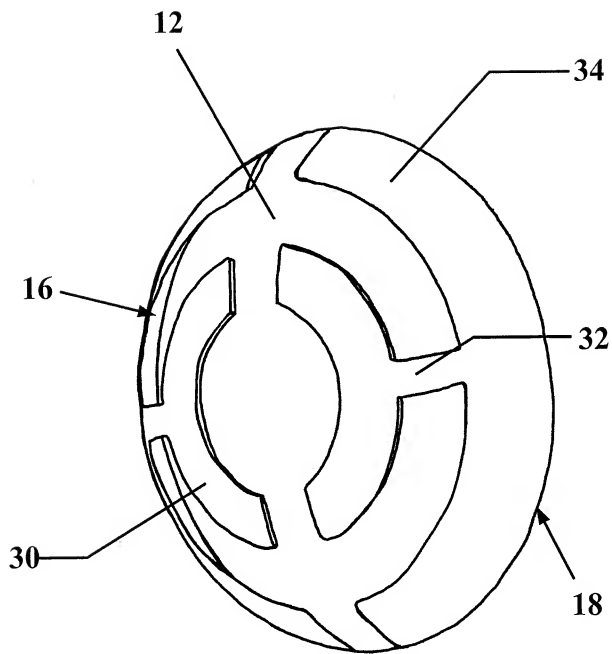


FIGURE 5

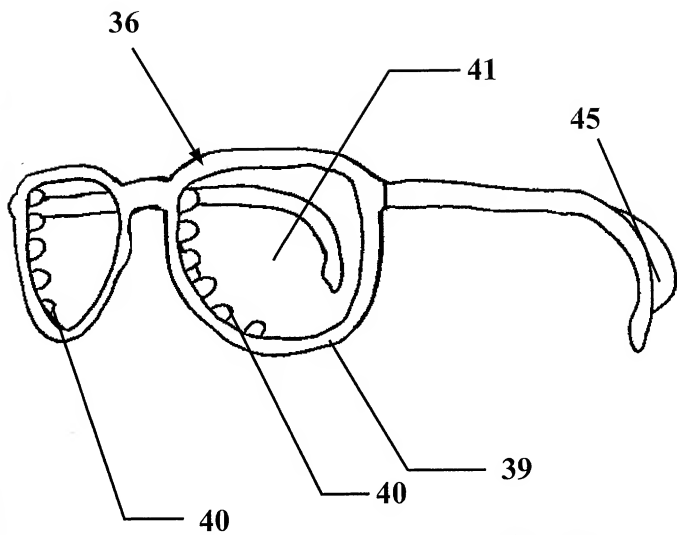


FIGURE 6

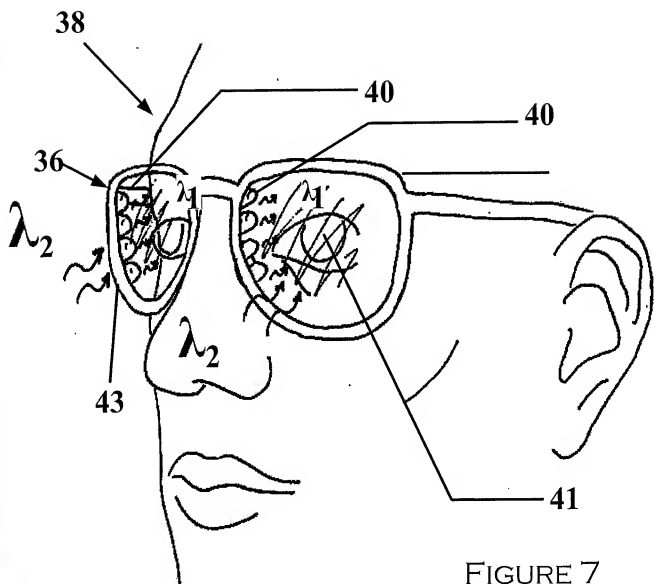


FIGURE 7



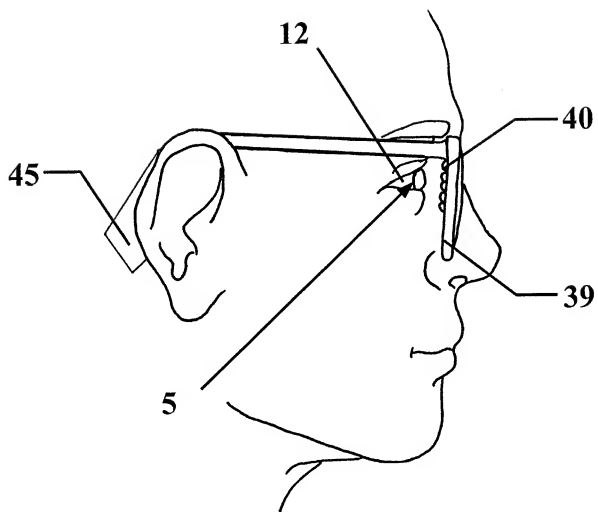


FIGURE 8

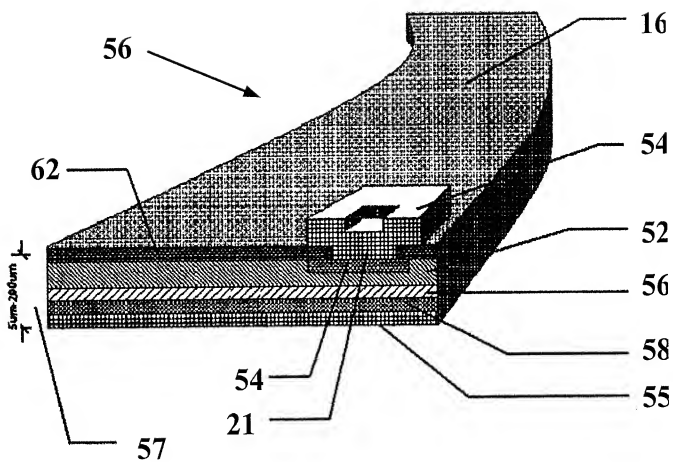


FIGURE 9

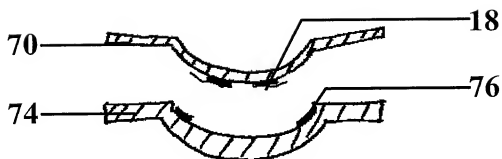


FIGURE 10A

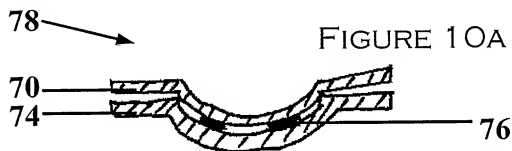


FIGURE 10B

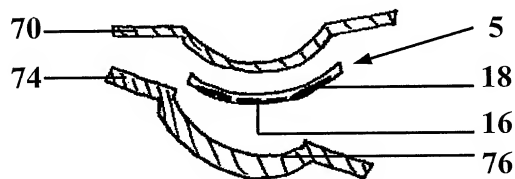


FIGURE 10C

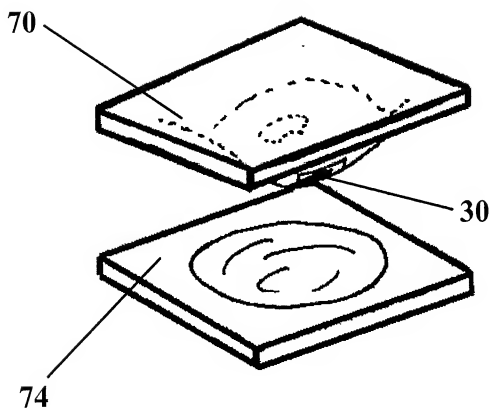


FIGURE 1 1

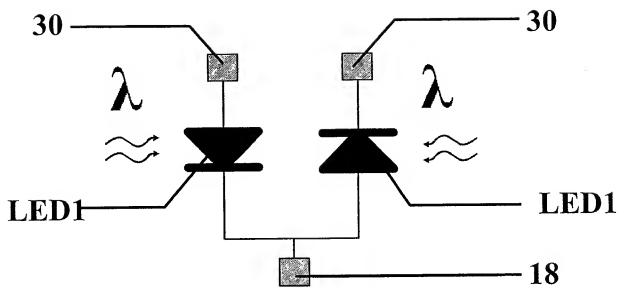


FIGURE 12A

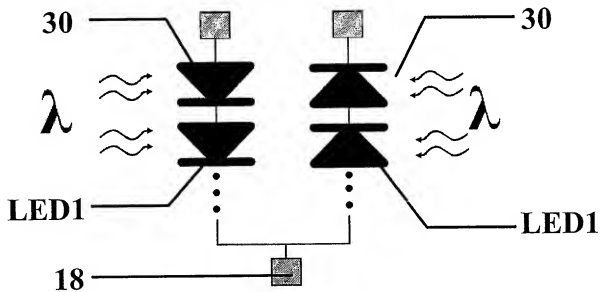


FIGURE 12B

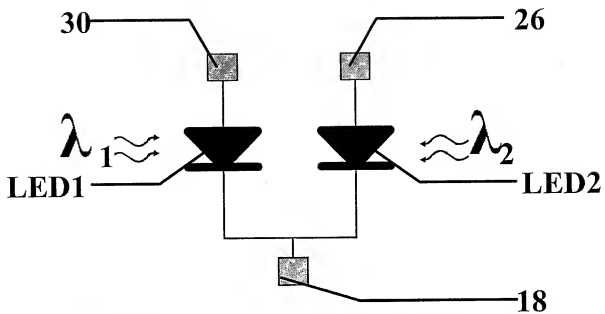


FIGURE 13A

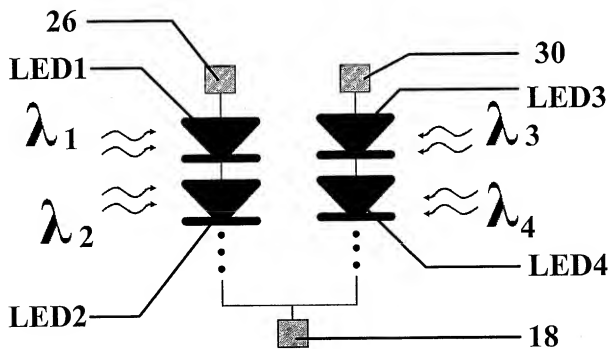


FIGURE 13B

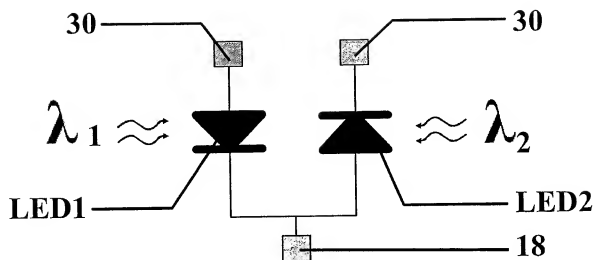


FIGURE 14A

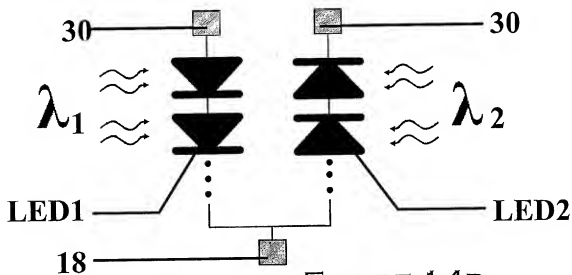


FIGURE 14B

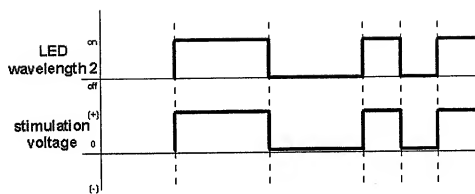


FIGURE 15



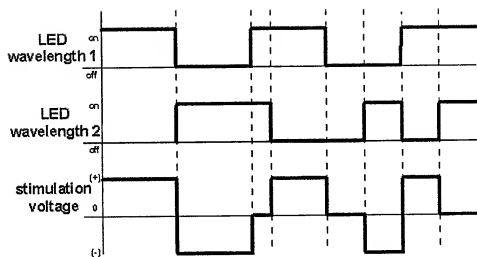


FIGURE 16

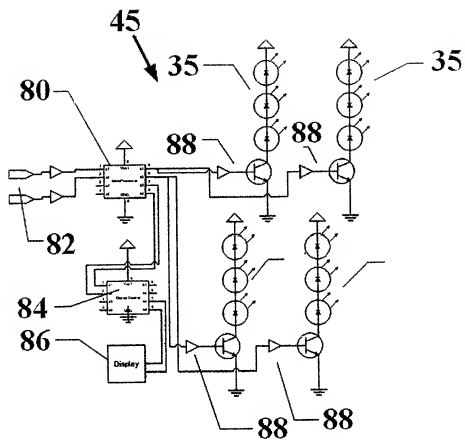


FIGURE 17

## ATTACHMENT B

(partial page abstracted from the internet)

# photodiode

A semiconductor diode that changes its electrical characteristics in response to illumination.



Wikipedia

A **photodiode** is an electronic component and a type of photodetector. It is a p-n junction designed to be responsive to optical input. Photodiodes are provided with either a window or optical fibre connection, in order to let in the light to the sensitive part of the device. They may also be used without a window to detect vacuum UV or X-rays.

Photodiodes can be used in either zero bias or reverse bias. In zero bias, light falling on the diode causes a voltage to develop across the device, leading to a current in the forward bias direction. This is called the photovoltaic effect, and is the basis for solar cells — in fact, a solar cell is just a large number of big, cheap photodiodes.

Diodes usually have extremely high resistance when reverse biased. This resistance is reduced when light of an appropriate frequency shines on the junction. Hence, a reverse biased diode can be used as a detector by monitoring the current running through it. Circuits based on this effect are more sensitive to light than ones based on the photovoltaic effect.

A **phototransistor** is in essence nothing more than a bipolar transistor that is encased in a transparent case so that light can reach the base-collector junction. The phototransistor works like a photodiode, but with a much higher sensitivity for light, because the electrons that are generated by photons in base-collector junction are injected into the base, this current is then amplified by the transistor operation. A phototransistor has a slower response time than a photodiode however.